On Acquiring a Complex Personal Reference System: Experimental Results from Thai Children with Autism

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Issue: While certain types of pragmatic inferences have been widely studied in the acquisition literature, implicated presuppositions has received much less attention, with some exceptions such as Yatsushiro (2008) and Legendre et al. (2011). Sauerland (2008) adopted Heim's Maximize Presupposition maxim to explain the semantic markedness of ϕ-features in pronouns. Since first and second persons possess a person ϕ-feature, they trigger the lexical presuppositions referring to the speaker and addressee/participant, respectively. The lack of such ϕ-feature on third person gives rise to an implicated presupposition that the referent is not the speaker nor the addressee/participant on this account. This study extends the contexts of pragmatically-derived inferences to the issue on deictic and person interpretations of pronouns in Thai, a language that is rich in personal reference terms and consists of not only over 50 personal pronouns, but also kin terms, occupational titles, and personal names (Bandhumedha 2011; Cooke 1968; Iwasaki & Ingkapirom 2009). The populations under examination include both typically-developing children (TD) and children with autism spectrum disorders (ASD), a population group which has long been observed to have difficulties with pronouns, manifested in the form of pronoun reversal errors between 'I' and 'you' in English (Chiat 1982; Fay 1979; Kanner 1943).

Table 1: Participant Information

	ASD N=29	TD N=67
Male N	24	55
Age M	9;10	9
Age *Min*	6;7	6;1
Age *Max*	12;2	12;8
Ravens IQ $M(SD)$	97.8 (22.24)	112.95 (15.46)

Methods: Children with ASD and their age-, gender-, and non-verbal-IQ-matched TD controls were recruited for the experiment (See Table 1). The main design of the experiment adapts the Fishing Task (Girouard et al. 1997; Legendre et al. 2011). The speech context comprises five participants, including the experimenter, the child (tested individually), and 20-inch-tall cardboard figures of a boy, a girl, and a monkey. In the beginning of each block, the children were first asked to name pictures of commonly known animals and objects. The pictures were then distributed across participants. The initial task was the production task where each child was asked 'Who is holding X?' twice for each target in a pre-randomized order, leading to answers of '*Referential form* is holding X'. The comprehension task involved the familiarization phase using the question 'What is {*the boy/girl/monkey/child's name*} holding?', while the test phase used different pronouns instead of nouns or names. The test phase included 8 personal reference terms (1 first-person, 4 second-persons (3 for each participant, depending on their gender), and 3 third-persons). The order of pronouns in question was pre-randomized.

Results: Overall Accuracy - An answer is marked as accurate when it refers to the right referent. The accuracy rate for production is near ceiling for both ASD (94.6%) and TD (90.6%) groups, although the difference is significant (Mann-Whitney U=97595, p=0.04). The accuracy rate for comprehension dropped for both groups (60.4% for ASD; 82.3% for TD) with a much sharper drop for ASD. The comprehension task accuracy thus yields a

highly significant difference across participant groups (Mann-Whitney U=658640, p<0.001).
PRODUCTION - The most common personal reference terms that the children in both groups used to refer to themselves are personal names and personal pronouns. However, they were found in a reversed preferred pattern, i.e., in ASD group, personal names were used 57.4% of the time versus 25.9% for personal pronouns, compared to 15.7% versus 75.2%, respectively, for TD. The proportion of counts for the two most commonly-chosen categories for self-reference showed a very significant difference across participant groups (Fisher's Exact, p<0.001). The choice for referring to the experimenter and all other third-persons was not significantly different across groups (Fisher's Exact, p=0.23 and p=0.19 respectively).
COMPREHENSION - Overall, third person yields the poorest performance for the ASD group (See Figure 1 for details). As for the TD group, only the male third person yields poorer performance. The only form where ASD children outperformed TD children is the formal second-person pronoun with a non-ambiguous referent. The TD's performance seems to be suppressed by the social awkwardness of using the pronoun to refer to a child, while the ASD children solely paid attention to the person ϕ-feature.

Discussion: The results of this study suggest that children with ASD are able to comprehend the second person lexical presupposition suggested by the person ϕ-feature, when the pronoun does not have person underspecification. The pattern of errors in the comprehension task also supports the analysis. However, in the production task, when they have their freedom of choice as the language allows for many acceptable variants, ASD children avoid person deixis by choosing fixed referential terms (names), rather than terms with a higher level of person deixis (pronouns). The social deictic dimension of the formal second-person pronouns was also largely ignored by the children with ASD. In terms of implicated presuppositions across populations, challenges arise to resolve implicated presuppositions when certain ϕ-features are unspecified. For the ASD group, person unmarkedness alone could decrease their performance, as can be seen in the lower performance in all the third-person forms. The further pragmatic inference that has to be made for gender unmarkedness of male pronouns had an additive decreasing effect in the ASD group. On the other hand, the TD's performance was only affected in male third-person pronouns, but not the other third-person forms. This suggests that the TD group may only be affected when two implicated presuppositions (from person and gender unmarkedness) appear simultaneously or that the gender unmarkedness is particularly difficult for them. Such performance on different kinds of implicated presuppositions and deixis might correspond to the order of acquisition. On a final note, three other second-person pronouns were tested in the comprehension task, yielding different results from the formal second-person term presented in the abstract. Two of them are commonly used in deictic-center shifting, where adult native

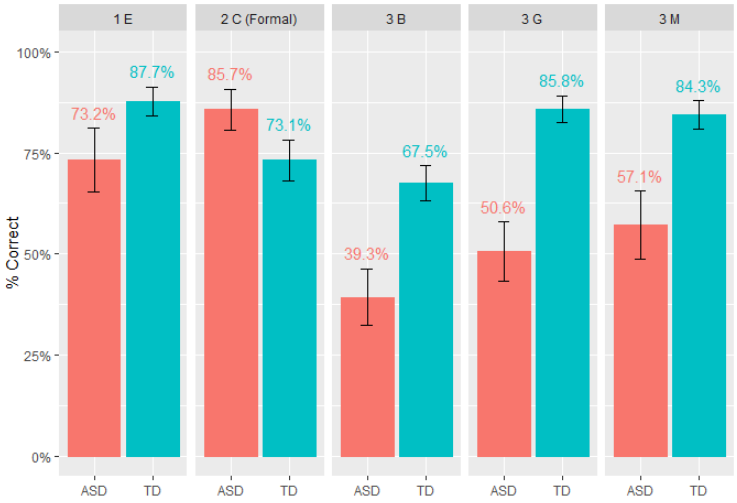

Figure 1: Accuracy in Comprehension Task by Target (E=Experimenter; C=Child; B=Boy; G=Girl; M=Monkey)

speakers of Thai seem to, prima facie, reverse 'I' and 'you' while talking to young children, e.g., asking whether a child wants ice cream by using the sentence 'Do I want ice cream?'. A discussion, comparing the phenomenon with person underspecification, will also be provided.

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